

CLAIMS

What is claimed is:

1. A method to process a multicast transfer request within an interconnect device, the method including:

receiving the multicast transfer request pertaining to a packet stored by the interconnect device;

spawning a number of unicast transfer requests based on the multicast transfer request;

responsive to a generation of a transfer grant for at least one of the number of unicast transfer requests, determining whether transfer grants have been generated for all of the number of unicast transfer requests;

if transfer grants have been generated for all of the number of unicast transfer requests, then discarding the packet to which the multicast transfer request pertains; and

if transfer grants have not been generated for all of the number of unicast transfer requests, then retaining the packet to which the multicast transfer request pertains.

2. The method of claim 1 wherein the discarding of the packet includes freeing a memory location at which the packet is stored by the interconnect device, and the retaining of the packet includes continuing storage at the memory location at which the packet is stored by the interconnect device.

3. The method of claim 1 including generating a spawn count of the number of unicast transfer requests spawned based on the multicast transfer request, and maintaining a transfer grant count of a number of transfer grants generated responsive to the number of unicast transfer requests, wherein the determination includes determining whether the transfer grant count equals the spawn count.

4. The method of claim 1 including generating a spawn count of the number of unicast transfer requests spawned based on the multicast transfer request, and decrementing the spawn count responsive to the generation of the transfer grant, wherein the determining includes determining whether the spawn count is equal to zero.

5. The method of claim 3 wherein the packet is received at an input port of the interconnect device and wherein the packet is stored at a memory location associated with the input port.

6. The method of claim 5 wherein the multicast transfer request is issued from the input port to an arbiter.
7. The method of claim 6 wherein the arbiter is a central arbiter associated with the interconnect device and is coupled to receive and arbitrate between transfer requests received from a plurality of input ports of the interconnect device.
8. The method of claim 6 wherein the spawning and the generation of the spawn count are performed by the arbiter, and wherein the spawn count is communicated to, and stored at, the memory location in association with the packet.
9. The method of claim 5 wherein the determination is performed by a grant controller associated with the input port.
10. The method of claim 3 wherein the generation of the spawn count includes identifying a number of output ports of the interconnect device to which the packet should be transmitted.
11. The method of claim 10 wherein the identifying of the number of output ports includes performing a lookup on a multicast forwarding table utilizing a destination address of the multicast transfer request.

12. The method of claim 11 wherein the lookup is to retrieve a multicast vector comprising a sequence of bits, at least one of the sequence of bits being set to identify an output port of the interconnect device.

13. The method of claim 12 wherein the identifying of the number of output ports includes performing a count of a number of set bits within the multicast vector.

14. A system to process a multicast transfer request within an interconnect device, the system including:

a multicast processor to spawn a number of unicast transfer requests based on the multicast transfer request, the multicast transfer request pertaining to a packet stored by the interconnect device;

a grant control coupled to receive transfer grants from an arbiter of the interconnect device and, responsive to receipt of a transfer grant for at least one of the number of unicast transfer requests, to determine whether transfer grants have been generated for all of the number of unicast transfer requests;

wherein the grant control, if transfer grants have been generated for all of the number of unicast transfer requests, is to discard the packet to which the multicast transfer request pertains and, if transfer grants have not been

generated for all of the number of unicast transfer requests, is to retain the packet to which the multicast transfer request pertains.

15. The system of claim 14 wherein the control grant is to discard the packet by freeing a memory location at which the packet is stored by the interconnect device, and to retain the packet by continuing storage at the memory location at which the packet is stored by the interconnect device.

16. The system of claim 14 wherein the multicast processor is to generate a spawn count of the number of unicast transfer requests spawned based on the multicast transfer request, and the grant control is to maintain a transfer grant count of a number of transfer grants generated and receipt by the grant control responsive to the number of unicast transfer requests, wherein the grant control is to determine whether the transfer grant count equals the spawn count.

17. The system of claim 14 wherein the multicast processor is to generate a spawn count of the number of unicast transfer requests spawned based on the multicast transfer request, and the grant controller is to decrement the spawn count responsive to the generation and receipt by the grant control of the transfer grant, wherein the grant control is to determine whether the spawn count is equal to zero.

18. The system of claim 16 wherein the packet is received at an input port of the interconnect device and wherein the packet is stored at a memory location associated with the input port.

19. The system of claim 18 wherein the multicast transfer request is issued from the input port to an arbiter, and wherein the arbiter includes the multicast processor.

20. The system of claim 19 wherein the arbiter is a central arbiter associated with the interconnect device and is coupled to receive and arbitrate between transfer requests received from a plurality of input ports of the interconnect device.

21. The system of claim 19 wherein the multicast processor is to communicate the spawn count for storage at the memory location in association with the packet.

22. The system of claim 16 wherein the multicast processor, during generation of the spawn count, is to identify a number of output ports of the interconnect device to which the packet should be transmitted.

23. The system of claim 22 wherein the multicast processor used to perform a lookup on a multicast forwarding table utilizing a destination address of the multicast transfer request to identify the number of output ports of interconnect device to which the packet should be transmitted.

24. The system of claim 23 wherein the multicast processor is to perform the lookup to retrieve a multicast vector comprising a sequence of bits, at least one of the sequence of bits being set to identify an output port of the interconnect device.

25. The system of claim 24 wherein the multicast processor is to identify the number of output ports by performing a count of a number of set bits within the multicast vector.

26. A machine-readable medium storing a description of a circuit, said circuit comprising:

a multicast processor to spawn a number of unicast transfer requests based on the multicast transfer request, the multicast transfer request pertaining to a packet stored by the interconnect device;

a grant control coupled to receive transfer grants from an arbiter of the interconnect device and, responsive to receipt of a transfer grant for at least one of the number of unicast transfer requests, to determine whether transfer grants have been generated for all of the number of unicast transfer requests;

wherein the grant control, if transfer grants have been generated for all of the number of unicast transfer requests, is to discard the packet

to which the multicast transfer request pertains and, if transfer grants have not been generated for all of the number of unicast transfer requests, is to retain the packet to which the multicast transfer request pertains.

27. The machine-readable medium of claim 26 wherein the description comprises a behavioral level description of the circuit.

28. The machine-readable medium of claim 27 wherein the behavioral level description is compatible with a VHDL format.

29. The machine-readable medium of claim 26 wherein the behavioral level description is compatible with a Verilog format.

30. The machine-readable medium of claim 26 wherein the description comprises a register transfer level netlist.

31. The machine-readable medium of claim 26 wherein the description comprises a transistor level netlist.